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III. REMARKS/ARGUMENTS

The Examiner will note that claim 4 has been incorporated into claim 1 and claim 4 cancelled without prejudice. The addition of the value of z in claim 1 is supported on page 6, lines 14-15. In addition, the dependency of claims 5 and 6 has been corrected in light of the cancellation of claim 4. The amendment to claim 3 is supported on page 6, lines 12, and the amendment to claim 6 is supported on page 6, line 13. The Examiner will note that values for temperature, pressure and gas rates have been converted to metric values.

First Rejection

Claims 1-13 were rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of U.S. Patent No 6,582,590. Although the conflicting claims are not identical, they are not patentably distinct from each other because both respective sets of claims are directed to a similar hydroprocessing process which employ the same bulk multimetallic catalyst having a composition as recited in the instant claims. See, in particular, instant claims 1 and 4, and claims 1 and 8-10 of the '590 patent.

Although the claims in the '590 patent are directed to a "multistage hydroprocessing process", the patented process and the instantly claimed process are considered synonymous, as they each recite the steps of treating a feed with hydrogen at comparable process conditions.

Applicant's Response to the First Rejection

Attached hereto is a terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) to overcome this ground for rejection.

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Second Rejection

Claims 1-13 were rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8 of U.S. Patent No 6,755,963. Although the conflicting claims are not identical, they are not patentably distinct from each other because both respective sets of claims are directed to employing the same or similar bulk multimetallic catalyst recited in the instant claims. The patented claims are directed to a "hydrotreating process for hydrocarbon resin or rosin molecules", whereas the instant claims re directed to "a process for hydroprocessing a petroleum feedstock". However, the respective processes are synonymous, as they each recite the steps of treating a feed with hydrogen at comparable process conditions.

Applicant's Response to the Second Rejection

Attached hereto is a terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) to overcome this ground for rejection.

Third Rejection

Claims 1-13 were rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-18 of U.S. Patent No 6,712,955. Although the conflicting claims are not identical, they are not patentably distinct from each other because the respective sets of claims are directed to hydroprocessing, each employing the same or similar bulk multimetallic catalyst, as formulaically represented by both the instant claims and the patented claims.

Applicant's Response to the Third Rejection

Attached hereto is a terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) to overcome this ground for rejection.

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Fourth Rejection

Claims 1-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over either: Mills et al. (US 3,619,414), Ho et al. (IS 5,841,013) or EP 0203228. Mills et al. was cited as disclosing a process for the catalytic hydrofinishing of petroleum distillates in the presence of a catalyst comprising the oxides of: 4-16 wt.% molybdenum, and a combination of about 10-25 wt.% nickel and tungsten. Exemplary process conditions include a temperature range of about 500°F to about 800°F, a LHSV ranging between 0.1 and 8, and a pressure ranging between about 500 and 3000 psig. See the Abstract of Mills et al., as well as col. 2, lines 22-42 and col. 3, line 56 to col. 4, line 23.

Ho et al. was cited as disclosing a hydrogenation process that uses a highly active aromatic hydrogenation catalyst. Said catalyst comprises a mixed metal oxide catalyst represented by the formula $ML(Mo_yW_{1-y}O_b)_a$, wherein M is chromium (Cr) and/or one or more divalent promoter metals selected from the group consisting of: Mn, Fe, Co, Ni, Cu, and Zn, L is one or more neutral nitrogen-containing ligands (at least one of which is a chelating polydentate ligand), the variable y ranges between 0 and 1 (end points inclusive), and the variable a equals 1 for non-chromium containing catalysts, but ranges between 0.5 and 3 (end points inclusive) for catalysts containing chromium. Process conditions include temperatures of 300°F - 800°F, pressures of 100-3000 psig, hydrogen feed rates of 300-3000 SCF/B, and LHSVs of 0.5-8.0. See the Abstract of Ho et al., as well as col. 1, lines 35-62 and col. 5, lines 15-22.

The European Patent discloses a process for hydrotreating hydrocarbons, in which a catalyst system arranged in a stacked bed is employed. The catalyst system comprises an upper zone containing up to 10 wt.% of a Group VIII metal compound, and 3-15 wt.% of a Group VIB metal compound, and a lower zone containing up to 10 wt.% of a Group VIII metal compound and from 3-30 wt.% of a Group VIB metal compound. In both the upper and lower zones, the catalysts comprise a nickel and a molybdenum and/or tungsten component. See page 3, lines 31-45, page 4, lines 31-47 and page 5, lines 8-18 of the

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European Patent. Further the European Patent at Table 1 on page 6 therein, discloses exemplary process conditions comparable to those respectively recited in the instant claims.

Neither of the aforementioned references discloses the molar ratios of Group VIB metal to Group VIII metal, as recited in the instant claims.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of Mills et al., Ho et al., or the European Patent, such as the respectively disclosed weight percentages of the catalyst components, by determining through routine experimentation the optimum value of the molar ratios (considered result effective variables) of the disclosed catalyst components.

Applicant's Response to the Fourth Rejection

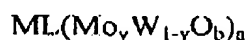
A. The catalysts of Mills et al. differ from those of applicants' amended claim 1 as follows:

1. Mills does not describe a catalyst having the formula set forth in amended claim 1. Catalysts meeting the formula of amended claim 1 are shown in the present examples to be superior for hydroprocessing.

2. The passages cited by the Examiner all describe supported catalysts (Abstract, lines 11-12 thereof, col.2, line 31 and col. 3, lines 59-60). The last citation is to a metal oxide on carriers meaning that the catalyst is supported. In contrast, applicants' catalysts are bulk metal catalysts meaning that they are unsupported. Mills does not teach or suggest the simultaneous presence of a Ni, Mo and W or Co, Mo and W in a bulk (unsupported) catalytic material.

Based on the above, it is urged that Mills neither teaches nor suggests the catalyst having the formula set forth in amended claim 1.

B. The Ho et al. patent teaches a aromatics hydrogenation catalyst prepared from a metal amine catalyst precursor has the general formula



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where M is Cr and/or one or more divalent promoter metals selected from the group consisting of Mn, Fe, Co, Ni, Cu and Zn; L is one or more neutral nitrogen-containing ligands at least one of which is a chelating polydentate ligand; $0 \leq y \leq 1$; for non-chromium containing catalysts $a=1$ and for chromium containing catalysts $0.5 \leq a \leq 3$, at a temperature of about 200 °C. to about 400 °C. in an inert atmosphere; then reducing at a temperature of about 300 °C. to about 450 °C. said metal amine catalyst precursor to form a mixed metal oxide catalyst having the general formula



wherein $b < 4$ and M, L and y are as stated for step (a). (col. 1, lines 35-57)

As noted above, the Ho et al. catalyst and catalyst precursor both require the presence of a ligand L which a polydentate chelating ligand. Applicants' catalyst given in the formula in amended claim 1 contains no ligand L. Ho et al. also show the criticality of activating the catalyst in hydrogen at high temperature (ex 1). In contrast, our catalyst does not contain any nitrogen containing ligands of any kind and the catalysts are activated in a feed containing sulfur. Thus applicants' catalyst as given in amended claim 1 is patentably distinct from the catalyst of Ho et al.

C. EP 0203228 describes a stacked bed hydrofinishing catalyst system, utilizing two types of catalysts. In all cases, the patent describes the use conventional (i.e. supported) bimetallic catalysts, the first of the two catalysts containing P as well. The EP patent uses a conventional alumina support. This document does not disclose anywhere a bulk (i.e. unsupported) catalyst. This document does not disclose either bulk trimetallic catalysts. The catalysts described on page 4 of the specification are conventional catalysts in contrast to the present new catalyst compositions as described in amended claim 1. Thus it is urged that the EP patent cannot teach or suggest the catalyst set forth in applicants' claims.

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In view of the amended claims and for the reasons set forth above, it is urged that applicants have made a patentable advance in the art. The Examiner is requested to withdraw the rejections noted above based on the present amendments and terminal disclaimers filed herewith, and pass the case to allowance.

Respectfully submitted,



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☒ Pursuant to 37 CFR 1.34(a)

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